State of California
AIR RESOURCES BOARD

Resolution 95-45

October 26, 1995

Agenda Item No.: 95-11-2

WHEREAS, Health and Safety Code sections 39600 and 39601 authorize the Air Resources Board (the "Board") to adopt standards, rules, and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, Health and Safety Code section 43018(a) directs the Board to endeavor to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of the state ambient air quality standards at the earliest practicable date;

WHEREAS, Health and Safety Code section 43018(c) provides that in carrying out section 43018, the Board shall adopt standards and regulations which will result in the most cost-effective combination of control measures on all classes of motor vehicles and motor vehicle fuel, including but not limited to the specifications of vehicular fuel composition;

WHEREAS, Health and Safety Code section 43013 authorizes the Board to adopt and implement motor vehicle fuel specifications for the control of air contaminants and sources of air pollution which the Board has found to be necessary, cost-effective, and technologically feasible to carry out the purpose of Division 26 of the Health and Safety Code;

WHEREAS, title 13, California Code of Regulations, sections 2262.2, 2262.3, 2262.4, and 2262.7 are part of the Board's Phase 2 reformulated gasoline regulations and establish limits on the sulfur, benzene, olefin and aromatic hydrocarbon content respectively for California gasoline supplied on or after March 1, 1996;

WHEREAS, title 13, California Code of Regulations, section 2263(b), Table 1 designates the test methods to be used in determining compliance with the gasoline standards identified above;

WHEREAS, the staff has identified improved test methods for measuring the sulfur, benzene, olefin and aromatic hydrocarbon content of gasoline;

WHEREAS, staff has proposed amendments to title 13, California Code of Regulations, section 2263(b), as set forth in Attachment A, to incorporate the improved test methods;

WHEREAS, the California Environmental Quality Act and Board regulations require that no

project which may have significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to reduce or eliminate such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of chapter 3.5 (commencing with section 11340), part 1, division 3, title 2 of the Government Code;

WHEREAS, the Board has considered the effect of the proposed amendments on the economy of the state;

WHEREAS, the Board finds that:

The designation of Test Method ASTM D 2622-94 with a modified calibration procedure and reproducibility table for the measurement of sulfur in gasoline will improve the effectiveness of the Board's requirements regarding the sulfur content of California gasoline;

The designation of Test Method ASTM D 5453-93 as an alternative method for the measurement of gasoline sulfur content will allow greater flexibility in meeting the Board's requirements regarding the sulfur content of California gasoline without lessening the effectiveness of those requirements;

The designation of ASTM D5580-9x for the measurement of benzene in gasoline will improve the effectiveness of the Board's requirements regarding the benzene content of California gasoline;

The designation of ASTM D1319-9x and the revised reproducibility tables for the measurement of the olefin content of gasoline will improve the effectiveness of the Board's requirements regarding the olefin content of California gasoline;

The designation of ASTM D5580-9x for the measurement of aromatic hydrocarbon content of gasoline will improve the effectiveness of the Board's requirements regarding the aromatic hydrocarbon of California gasoline;

Establishing the lower limit of the scope of a test method as the minimum concentration allowed to be reported where a test method does not specify the limit of detection will preserve the effectiveness of the Board's requirements for California gasoline; and

The amendments adopted herein will not result in any significant adverse environmental impacts, and will have no, or an insignificant, impact on California business enterprises.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves the amendments to section 2263, title 13, California Code of Regulations, as set forth in Attachment A hereto.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to consider any new or additional data regarding the reproducibility, accuracy or scope of the approved test methods submitted by December 1, 1995 and shall make additional modifications to section 2263, title 13, California Code of Regulations, to reflect the new data if appropriate, provided that he shall present the modifications to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to adopt the amendments to section 2263, title 13, California Code of Regulations, as set forth in Attachment A with additional modifications as provided for herein, after making them available to the public for a period of 15 days, provided that the Executive Officer shall consider such written comments as may be submitted during this period as required by Government Code section 11346.8, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that the Board directs the staff to continue working with industry to develop an appropriate mechanism for establishing minimum detection or quantitation limits, as appropriate, for all test methods used to measure the content of California gasoline.

BE IT FURTHER RESOLVED that, following approval by the Office of Administrative Law of the amendments adopted herein, the Executive Officer is directed, as appropriate, to adopt the amendments as part of the California State Implementation Plan and to submit them to the U.S. Environmental Protection Agency as a revision to the California State Implementation Plan.

I hereby certify that the above is a true and correct copy of Resolution 95-45, as adopted by the Air Resources Board.

Pat Hutchens

Pat Hutchens, Board Secretary

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Identification of Attachment to the Resolution

Attachment A: Proposed Amendments to title 13, California Code of Regulations, section 2263(b) as set forth in this Attachment A

Amend section 2263, title 13, California Code of Regulations, to read as follows:

Subarticle 2. Standards for Gasoline Sold Beginning March 1, 1996

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Section 2263. Sampling Procedures and Test Methods

(a) *Sampling Procedures.*
In determining compliance with the standards set forth in this subarticle 2, an applicable sampling methodology set forth in 13 C.C.R. section 2296 ~~shall~~ *must* be used.

(b) *Test Methods.*
(1) In determining compliance with the standards set forth in this subarticle 2, the test methods presented in Table 1 ~~shall~~ *must* be used. All identified test methods are incorporated herein by reference.

Table 1

Section	*Gasoline Specification*	*Test Method*[a]
2262.1.	Reid Vapor Pressure	ASTM D 323-58[a,b] or 13 C.C.R. section 2297
2262.2.	Sulfur Content ~~1 ppm to <30 ppm~~	~~ASTM D 2622-87~~ ASTM D 2622-94[b, c, d, e] *or* ASTM D 5453-93 [c, f]
2262.3.	Benzene Content	ASTM ~~3606-87~~ D 5580-9X ~~or ARB MLD 116[b]~~
2262.4.	Olefin Content	ASTM D 1319-~~89~~-9X [a, e]
2262.5.	Oxygen Content	ASTM D 4815-94
2262.6.	T90 and T50	ASTM D 86-90
2262.7.	Aromatic Hydrocarbon Content	~~ARB MLD 116[b]~~ ASTM D 5580-9X

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a *Do not report values below the limit of detection (LOD) specified in the test method. Where a test method does not specify a LOD, do not report values below the lower limit of the scope of the test method.*

b Delete paragraph 4(b) concerning sampling.

~~b Air Resources Board, Monitoring and Laboratory Division, "Procedure for the Analysis of Benzene and Other Aromatic Components of Gasoline," dated November 1991. This method is to be used instead of ASTM 3606-87 to determine benzene content if ethanol is present.~~

~~b Results showing sulfur concentration of 30 ppm or less using this method shall be reported as 30 ppm.~~

c Make the following modifications to paragraph 9.1:

1. Low Level Sulfur Calibration Procedure

Reagents
Thiophene, at least 99% purity
2-Methylthiophene, at least 98% purity
Toluene, reagent grade
2,2,4 - Trimethylpentane, reagent grade

Preparation of Stock Standard
Weigh standard materials thiophene (~0.7290 gm) and 2-methylthiophene (~0.7031 gm) separately into a tared volumetric flask and record the individual mass to 0.1 mg. Add "mixed solvent" containing 25% toluene and 75% iso-octane (by volume) into the flask to a net weight of approximately 50 gm and record the weight. This "Stock Standard" contains approximately 10 mg/gm sulfur. The actual sulfur concentration can be calculated as follows:

Sulfur from thiophene (gm) =
Weight of thiophene * 32.06 * purity / 84.14

Sulfur from 2-methylthiophene (gm) =
Weight of 2-methylthiophene * 32.06 * purity / 98.17

Sulfur concentration of Stock Standard (gm/gm) =
(sulfur from thiophene + sulfur from 2-methylthiophene) / net weight of the stock standard

Multiply the sulfur concentration by 1000 to convert the unit to mg/gm.

Preparation of Calibration Standards
Pipet 2.5 ml of the Stock Standard to 250 ml flask and dilute with the "mixed solvent" to the mark. The "Diluted Standard" contains approximately 100 mg/kg sulfur. Prepare ~~1,~~ 5, 10, 20, 30, ~~40,~~ 50, *75* ppm calibration standards by pipetting ~~1,~~ 5, 10, 20, 30, ~~40,~~ 50, *75* ml of the Diluted Standard into a 100 ml flask, respectively, and

diluting with the "mixed solvent" to the mark. The actual concentration of the calibration standard should be determined from the stock standard. The standards with concentration ranging from ~~1~~ 5 to 100 ppm *and the "mixed solvent"* are to be used for calibrating the instrument.

d Replace ASTM D 2622-94 reproducibility values with the following:

Sulfur Content, ppm	Reproducibility
10 to 30 *[xxxxx]*	89.5 *[xx]* % X Sulfur Content (ppm)
30 to 60 *[xxxxx]*	25.7 *[xx]* % X Sulfur Content (ppm)
60 to 100 *[xxxxx]*	18.9 *[xx]* % X Sulfur Content (ppm)

~~e As an alternative to the designated test method (ASTM D 2622-94), D 5453-93 may be used for gasoline with sulfur concentrations of 30 ppm or above provided the results from testing with D 5453-93 are correlated with ASTM D 2622-94 as modified in e above.~~

~~f Report results as sulfur content no less than 1 ppm.~~

~~g~~e Add *the following* reproducibility statements for oxygenate-containing samples:

	Range	~~Repeatability~~	Reproducibility
~~Aromatics~~	~~13 - 40~~	~~1.3~~	~~3.7~~
Olefins	~~4~~ *0.3* - 33	~~0.258 (X) $^{0.6}$~~	0.819 (X) $^{0.6}$
~~Saturates~~	~~15 - 68~~	~~1.5~~	~~4.2~~

X = Volume %

(c) ***Equivalent Methods.***
Whenever this section provides for the use of a specified test method, another test method may be used following a determination by the executive officer that the other method produces results equivalent to the results with the specified method.

NOTE: Authority cited: Health and Safety Code sections 39600, 39601, 43013, 43018 and 43101; and *Western Oil and Gas Ass'n* v. *Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: Health and Safety Code sections 39000, 39001, 39002, 39010, 39500, 39515, 39516, 39606, 41511, 43000, 43016, 43018 and 43101; and *Western Oil and Gas Ass'n*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).